UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,147	01/16/2002	Zhiwei Ying	42390.P10423	1044

7590	09/28/2005	

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EXAMINER
VO, HUYEN X

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO 90C (Rev 10/03)

<table>
<tr><td rowspan="2" style="text-align:center; vertical-align:middle;">Office Action Summary</td><td>Application No.
10/052,147</td><td colspan="2">Applicant(s)
YING ET AL.</td></tr>
<tr><td>Examiner
Huyen X. Vo</td><td>Art Unit
2655</td><td></td></tr>
</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _16 January 2002_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-27_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-6,9,10,13-15,18-21,24 and 27_ is/are rejected.

7)☒ Claim(s) _7-8, 11-12, 16-17, 22-23, and 25-26_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _16 January 2002_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date ~~916222~~.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-6, 9-10, 13-15, 18-21, 24, and 27 are rejected under 35 U.S.C. 103(a)

as being unpatentable over Hirschberg (US 6173262) in view of Chen et al. (IEEE

Publication incorporated by reference).

3.   Regarding claims 1, 14, and 19, Hirschberg discloses a method, comprising:

receiving a text sentence comprising a plurality of words, each of the plurality of words

having a part of speech (POS) tag (*col. 4, lines 1-67*); and generating a POS sequence

based on the POS tag of each of the plurality of words (*col. 4, lines 1-67, particularly

lines 37-38*); detecting prosodic phrase break through CART or other neural network

such as HMM neural network (*col. 5, line 1 to col. 6, line 10 and also referring to col. 7,

lines 26-46*); and generating a prosodic phrase boundary based on the prosodic phrase

break (*col. 5, line 1 to col. 6, line 10*). Hirschberg fails to specifically disclose the step of

detecting prosodic phrase break though a RNN rather than CART. However, Chen et

. al. teach the step of detecting a prosodic phrase break through a recurrent neural

network (RNN) (*pages 229-232*).

Since Hirschberg and Chen et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Hirschberg by incorporating the teaching of Chen et al. in order to improve the naturalness of synthesized speech.

4.   Regarding claims 2-5, 15, an 20, Hirschberg further teaches assigning a POS tag for each of the plurality of words of the sentence (*col. 4, lines 1-67*); and classifying the POS tag for each of the plurality of words to a predetermined class (*col. 4, lines 1-67*), wherein the classification of the POS tag comprises adjective, adverb, noun, verb, and number (*col. 4, lines 37-38*), wherein the classification of the POS tag further comprises quantifier, preposition, conjunction, idiom, and punctuation (*col. 4, lines 37-38*), and segmenting the sentence into the plurality of words (*col. 4, lines 1-67, inherently included in the system of Hirschberg in that input text must first be broken up into individual words or segments, referring to figure 3*).

5.   Regarding claims 6, 10, 21, and 24, Hirschberg fails to specifically disclose detecting the prosodic phrase break through the RNN network comprises: initializing the RNN network; retrieving a POS tag from the tag sequence; inputting the POS tag to the RNN network; generating an output phrase break associated with the POS tag, from the RNN network; retrieving a next POS tag from the tag sequence; and repeating inputting the POS tag, generating an output phrase break, and retrieving a next POS tag, until there are no more POS tags to be processed in the tag sequence.

However, Chen et al. teach initializing the RNN network (*inherent that feedback loop must be zero or some initial constant in the first iteration in figure 3*); retrieving a POS tag from the tag sequence (*POS input in figure 3*); inputting the POS tag to the RNN network (*POS input in figure 3*); generating an output phrase break associated with the POS tag, from the RNN network (*the first part of the RNN, pages 229, section III*); retrieving a next POS tag from the tag sequence (*processing word by word, figure 3*); and repeating inputting the POS tag, generating an output phrase break, and retrieving a next POS tag, until there are no more POS tags to be processed in the tag sequence (*the operation of figure 3*).

6.   Regarding claims 9, 13, 18, and 27, Hirschberg further discloses that the phrase break is generated based on the previously inputted POS tags and previously generated phrase break (*col. 5, line 1 to col. 6, line 10*). Hirschberg fails to specifically disclose that the phrase break is generated through the RNN network. However, Chen et al. teach that the phrase break is generated through the RNN network (*section III page 229*).

Since Hirschberg and Chen et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Hirschberg by incorporating the teaching of Chen et al. in order to improve the naturalness of synthesized speech.

Allowable Subject Matter

7.   Claims 7-8, 11-12, 16-17, 22-23, and 25-26 are objected to as being dependent

upon a rejected base claim, but would be allowable if rewritten in independent form

including all of the limitations of the base claim and any intervening claims.

8.   The following is a statement of reasons for the indication of allowable subject

matter: Hirschberg disclose a method of training a TTS or other system to assign

intonational features, such as intonational phrase boundaries, is described. The

method of training involves taking a set of predetermined text (not speech or a signal

representative of speech) and having a human annotate it with intonational feature

annotations. This results in annotated text. Next, the structure of the set of

predetermined text is analyzed to generate information. This information is used, along

with the intonational feature annotations, to generate a statistical representation. The

statistical representation may then be stored and repeatedly used to generate

synthesized speech from new sets of input text without training the TTS system further

(*referring to reference*). Chen et al. teach a method of using a RNN to determine

prosodic features for use in a TTS system (*referring to reference*). Both Hirschberg and

Chen et al. fail to specifically disclose initializing and inputting a second initial phrase

break to a third input of the RNN network; inputting the first POS tag of the tag

sequence to a fourth input of the RNN network; and inputting the second POS tag of the

tag sequence to a fifth input of the RNN network. Furthermore, it would have not been

obvious to one of ordinary skill in the art at the time of invention to modify Hirschberg

and/or Chen et al. in order to obtain the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen X. Vo whose telephone number is 571-272-7631. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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9/15/2005

W. R. YOUNG
PRIMARY EXAMINER